CLAIMS

1. A video quality assessment method, comprising the steps of:

matching sub-field/frame elements of a test video field/frame with corresponding sub-field/frame elements of at least one reference video field/frame; and

generating a video quality value in dependence on the matched sub-field/frame elements of the test and reference video fields/frames.

2. A method according to claim 1, wherein the matching step further comprises, for a sub-field/frame element of the test video field/frame, searching for a matching sub-field/frame element within M1 preceding and/or M2 succeeding reference video fields/frames to a temporally corresponding reference video field/frame to the test video field/frame.

3. A method according to claim 2, wherein M1 and M2 are predefined.

4. A method according to claims 2 or 3, wherein the searching step further comprises searching within a spatially bounded region of the reference video fields/frames about the corresponding position within the reference fields/frames as the test sub-field/frame element takes within the test video field/frame.

5. A method according to claim 4, wherein the spatial extent of the search region is predefined.

6. A method according to any of the preceding claims, wherein the matching step further comprises, for a sub-field/frame element of the test video field/frame:

defining a matching template comprising a portion of the test video field/frame including the sub-field/frame element; and

using the defined matching template to search for matching sub-field/frame elements in the at least one reference video field/frame.

7. A method according to any of the preceding claims, wherein the matching step further comprises calculating one or more matching statistic values and/or matching vectors; and wherein the generating step generates the video quality parameter in further dependence on the calculated matching statistic values and/or matching vectors.

8. A method according to claim 7, wherein the calculating step comprises:

constructing one or more histograms relating to the searched area(s) of the reference video field(s)/frame(s); and

calculating a matching statistic value for each histogram relating to the proportion of matched elements which contribute to the peak of the histogram.

9. A method according to any of the preceding claims, wherein the generating step further comprises:

calculating a plurality of video characteristic values respectively relating to characteristics of the test and/or reference video fields/frames in dependence on the matched sub-field/frame elements of the test and reference video fields/frames; and

integrating at least the calculated video characteristic values together to give the video quality value.

10. A method according to claim 9 when dependent on claims 7 or 8, wherein the integrating step further includes integrating the matching statistic value(s) with the calculated video characteristic values to give the video quality value.

11. A method according to claims 9 or 10, wherein the video characteristic values are respectively any two or more of the following values: one or more spatial frequency values; one or more texture values; at least one edge value; at least one luminance signal to noise ratio value; and/or one or more chrominance signal to noise ratio values.

12. A method according to claim 11, wherein the calculation of the edge value comprises, for a test field/frame:

counting a number of edges in each sub-field/frame element of the test field/frame;

counting a number of edges in each sub-field/frame element of the at least one reference field/frame matched to the sub-field/frame elements of the test field/frame; and

determining an edge value for the test field/frame in dependence on the respective counts.

13. A method according to claim 12, wherein the determining step further comprises:

calculating difference values between each pair of respective counts;

putting each calculated difference value to the power Q ;
summing the resulting values to give a sum value; and
putting the sum value to the power *1/Q* to give the edge value.

14. A method according to any of claims 9 to 13, wherein the integrating step further comprises weighting each value by a predetermined weighting factor; and summing the weighted values to give the video quality value.

15. A method according to claim 14, wherein the summing step is further arranged to sum the weighted values with a predetermined offset value.

16. A method according to any of claims 14 or 15, wherein the weighting factors and the offset value are dependent on the type of the test and reference video fields/frames.

17. A computer program or suite of programs so arranged such that when executed by a computer system it/they cause/s the system to perform the method of any of claims 1 to 16.

18. A modulated carrier signal incorporating data corresponding to the computer program or at least one of the suite of programs of claim 17.

19. A computer readable storage medium storing the computer program or at least one of the suite of computer programs of claim 17.

20. A system for video quality assessment, comprising:

matching means for matching sub-field/frame elements of a test video field/frame with corresponding sub-field/frame elements of at least one reference video field/frame; and

video processing means arranged in use to generate a video quality value in dependence on the matched sub-field/frame elements of the test and reference video fields/frames.

21. A system according to claim 20, wherein the matching means further comprises, temporal searching means arranged in use to search for a matching sub-field/frame

element within M1 preceding and/or M2 succeeding reference video fields/frames to a temporally corresponding reference video field/frame to the test video field/frame.

22. A system according to claim 21, wherein M1 and M2 are predefined.

23. A system according to claims 21 or 22, and further comprising spatial searching means arranged in use to search within a spatially bounded region of the reference video fields/frames about the corresponding position within the reference fields/frames as the test sub-field/frame element takes within the test video field/frame.

24. A system according to claim 23, wherein the spatial extent of the search region is predefined.

25. A system according to any of claims 20 to 24, wherein the matching means further comprises:-

means for defining a matching template comprising a portion of the test video field/frame including the sub-field/frame element; and

means for using the defined matching template to search for matching sub-field/frame elements in the at least one reference video field/frame.

26. A system according to any of claims 20 to 25, wherein the matching means further comprises calculating means arranged in use to calculate one or more matching statistic values and/or matching vectors; and wherein the video processing means is further arranged in use to generate the video quality parameter in further dependence on the calculated matching statistic values and/or matching vectors.

27. A system according to claim 26, wherein the calculating means further comprises:

histogram constructing means arranged in use to construct one or more histograms relating to the searched area(s) of the reference video field(s)/frame(s); and

matching statistic calculating means for calculating a matching statistic value for each histogram relating to the proportion of matched elements which contribute to the peak of the histogram.

28. A system according to any of claims 20 to 27, wherein the video processing means further comprises:

a plurality of analysis means respectively arranged in use to calculate a plurality of video characteristic values respectively relating to characteristics of the test and/or reference video fields/frames in dependence on the matched sub-field/frame elements of the test and reference video fields/frames; and

an integration means for integrating at least the calculated video characteristic values together to give the video quality value.

29. A system according to claim 28 when dependent on claims 26 or 27, wherein the integration means is further arranged to integrate the matching statistic value(s) with the calculated video characteristic values to give the video quality value.

30. A system according to claims 28 or 29, wherein the video characteristic values are respectively any two or more of the following values: one or more spatial frequency values; one or more texture values; at least one edge value; at least one luminance signal to noise ratio value; and/or one or more chrominance signal to noise ratio values.

31. A system according to claim 30, and further comprising edge calculation means comprising:

means for counting a number of edges in each sub-field/frame element of the test field/frame;

means for counting a number of edges in each sub-field/frame element of the at least one reference field/frame matched to the sub-field/frame elements of the test field/frame; and

means for determining an edge value for the test field/frame in dependence on the respective counts.

32. A system according to claim 31, wherein the means for determining further comprises an arithmetic calculator means arranged in use to:

calculate difference values between each pair of respective counts;

put each calculated difference value to the power Q;

sum the resulting values to give a sum value; and

put the sum value to the power $1/Q$ to give the edge value.

33. A system according to any of claims 28 to 32, wherein the integrating means further comprises weighting means for weighting each value by a predetermined weighting factor; and summing means for summing the weighted values to give the video quality value.

34. A system according to claim 33, wherein the summing means is further arranged to sum the weighted values with a predetermined offset value.

35. A system according to any of claims 33 or 34, wherein the weighting factors and the offset value are dependent on the type of the test and reference video fields/frames.